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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,951	07/08/2003	Myeong-Jin Lee	SAM-0433	7111

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EXAMINER
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NGUYEN, TANH Q

ART UNIT	PAPER NUMBER
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2182

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,951

Applicant(s)

LEE ET AL.

Examiner

Tanh Q. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.  
5) ☒ Claim(s) 8-11 is/are allowed.  
6) ☒ Claim(s) 12-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions would be required under 35 U.S.C. 121, if claims 1-17 were originally presented:

- I. Claims 1-7, drawn to a method, classified in class 710, subclass 240.
- II. Claims 8-11, drawn to a network controller, classified in class 710, subclass 240.
- III. Claims 12-17, drawn to a method, classified in class 710, subclass 240.

The inventions are distinct, each from the other because of the following reasons:

Inventions I, III and Invention II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice the process of Invention III, and to practice another and materially different process - the process of Invention I.

Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has a separate utility such as "determining a present operational state as an emergency mode when both the transmitting buffer and receiving buffer request access to the system bus, the occupancy level of the receiving buffer is higher than a threshold occupancy level of the

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receiving buffer, and the vacancy level of transmitting buffer is higher than a threshold vacancy level of the transmitting buffer”; and Invention I has a separate utility such as “comparing a vacancy level of data in the transmitting buffer and an occupancy level of data in the receiving buffer, determining whether at least one of the vacancy level of the transmitting buffer and the occupancy level of the receiving buffer is increasing and granting access to the system bus to one of the transmitting buffer and the receiving buffer based on the comparison and based on the determination result”. See MPEP § 806.05(d).

2. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Groups I, III, and a search required for Group I is not required for Group III, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

3. Since applicant has already received an action on the merits for the originally presented invention III, this invention has been constructively elected by original presentation for prosecution on the merits. Further, since applicant has also received an action on the merits for the originally presented invention II, this invention has also been constructively elected by original presentation for prosecution on the merits.

Accordingly, claims 1-7 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Specification***

5. The replacement abstract of the disclosure is objected to because it is not submitted on a separate sheet (37 CFR 1.72). Correction is required.

#### ***Claim Objections***

6. Claims 12-17 are objected to because of the following informalities: in claim 12, lines 7, 15, 17 recite "the determination result" respectively. It appears that "the determination result" refers to the result of determining a vacancy level in the transmitting buffer and an occupancy level in the receiving buffer recited in lines 5-6. If this is the case, applicant needs to distinguishing such determination result from the result of determining a present operational state recited in line 9. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yang et al. (USP 5,546,543)** in view of **Brown et al. (USP 6,397,287)**, and further in view of **Rudin et al. (USP 6,014,722)** and **O'Brien (USP 6,796,961)**.

10. As per claim 12, **Yang** teaches a method of controlling at least one of a transmitting buffer [220, FIG. 2] and a receiving buffer [210, FIG. 2] of a network controller [20, FIG. 2], comprising:

receiving at least one request for access of a system bus [15, FIG. 2] from the transmitting buffer and the receiving buffer [col. 4, lines 6-9]; and

determining an **occupancy level** of data in the transmitting buffer [investigate whether the number the amount of data resident in the transmit buffer is greater than a second threshold level (col. 4, lines 15-17), hence determining an occupancy level of data in the transmitting buffer] and a **vacancy level** of data in the receiving buffer [inquire whether the number of empty data byte locations is greater a first threshold level (col. 4, lines 12-14), hence determining a vacancy level of data in the receiving buffer] and granting access to the system bus to the transmitting buffer or the receiving buffer based on the determination result [col. 4, lines 10-22; col. 6, lines 32-39].

Yang, therefore, teaches the claimed invention except

- for determining a **vacancy level** (instead of an occupancy level) of the data in the transmitting buffer and an **occupancy level** (instead of a vacancy level) of data in the receiving buffer; and

- except for granting access to the system bus comprising determining a present operational state as an emergency mode when both the transmitting buffer and receiving buffer request access to the system bus, the occupancy level of the receiving buffer is higher than a threshold occupancy level of the receiving buffer, and the vacancy level of transmitting buffer is higher than a threshold vacancy level of the transmitting buffer; and comparing the occupancy level of data in the receiving buffer with the vacancy level of data in the transmitting buffer based on the determination result, and granting access to the system bus to one of the transmitting buffer and the receiving buffer based on the determination result.

**Brown** teaches for a transmitting buffer of a given size, the vacancy level

(TxFree) and the occupancy level (TxUsed) being complementary and may be inferred from one register value [col. 11, line 66-col. 12, line 9]; and for a receiving buffer of a given size, the vacancy level (RxFree) and the occupancy level (RxUsed) being complementary and may be inferred from one register value [col. 14, lines 28-38].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to infer the occupancy level of data in the transmitting buffer (having a given size) from the vacancy level of data in the transmitting buffer when the one register value of the transmitting buffer corresponds to the vacancy level of data in the transmitting buffer, as is taught by Brown - hence determining the vacancy level of data in the transmitting buffer in the process, and to infer the vacancy level of data in the receiving buffer (having a given size) from an occupancy level of data in the receiving buffer when the one register value of the receiving buffer corresponds to the occupancy level of data in the receiving buffer, as is taught by Brown - hence determining the occupancy level of data in the receiving buffer in the process, in order to properly grant access to the system bus (i.e. to use the determination result to grant access to the system bus to the transmitting buffer or the receiving buffer).

**Rudin** teaches determining a present operational state as an emergency mode [col. 3, lines 41-44; col. 4, lines 6-9; col. 4, lines 16-18] when both a transmitting buffer [17 - FIGs. 1, 3] and a receiving buffer [16 - FIGs. 1, 3] request access to the system bus [col. 3, lines 54-56; col. 4, lines 6-9], the occupancy level of the receiving buffer is higher than a threshold occupancy level of the receiving buffer [col. 3, lines 58-63; col. 3, line 66-col. 4, line 2], and the vacancy level of transmitting buffer is higher than a



threshold vacancy level of the transmitting buffer [col. 3, lines 58-66]. Rudin further teaches arbitrating channels (e.g. one channel associated with the transmitting buffer and another channel associated with the receiving buffer) that have entered the emergency state to determine which of the channels will be granted access to the system bus [col. 4, lines 10-16].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Rudin's teachings into the combination of Yang and Brown in order to determine whether an emergency mode has occurred for the transmitting buffer and the receiving buffer, and to arbitrate the transmitting buffer and the receiving buffer that have entered the emergency mode to properly grant access to the system bus.

The combination of Yang, Brown and Rudin does not teach arbitrating the transmitting buffer and the receiving buffer that have entered the emergency mode comprising comparing the occupancy level of data in the receiving buffer with the vacancy level of data in the transmitting buffer, and granting access of the system bus to one of the transmitting buffer and the receiving buffer accordingly.

**O'Brien** teaches an arbiter (hence an arbitration logic) comparing the occupancy level of data in a receiving buffer [occupancy level in a write buffer for device B, e.g. 10% - Table II, col. 4] with the vacancy level of data in a transmitting buffer [vacancy level in a read buffer for device A, e.g. 50% - Table II, col. 4] based on the determination result of the occupancy level in a receiving buffer and the vacancy level in a transmitting buffer, and granting access to a system bus [101, FIG. 1] to one of the transmitting

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buffer and the receiving buffer based on the determination result [granting access of the system bus to the read buffer for device A, which has the greatest need: col. 3, line 7-col. 5, line 5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate O'Brien's arbitration logic into the combination of Yang, Brown and Rudin, in order to grant access to the buffer that has the greatest need [i.e. a transmitting buffer that is closer to being empty than a receiving buffer being full; or a receiving buffer that is closer to being full than a transmitting buffer being empty].

11. As per claim 13, Rudin teaches when the present operational state does not correspond to the emergency mode, the arbitration is carried out using an assigned priority level [col. 4, lines 18-21].

O'Brien teaches the occupancy level of the receiving buffer being compared with the vacancy level of the transmitting buffer, the receiving buffer being granted access to the system bus when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, and the transmitting buffer being granted access to the system bus when the vacancy level of the transmitting buffer is higher than the occupancy level of the receiving buffer [col. 3, line 7-col. 5, line 5]. In essence, O'Brien teaches arbitrating for access to the system bus comprising granting access to the system bus to the buffer (either the transmitting buffer, or the receiving buffer) having the greatest need for avoiding an underrun (for a transmitting buffer) or overrun (for a receiving buffer).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate O'Brien arbitration logic - to provide an assigned priority level when the present operational state does not correspond to the emergency mode, in order to grant access of the system bus to one of the transmitting and receiving buffers that has the greatest need of avoiding an underrun (for a transmitting buffer) or an overrun (for a receiving buffer).

12. As per claim 14, Rudin teaches when the present operational state corresponds to the emergency mode, arbitrating the channels that have entered the emergency state to determine which of the channels will be granted access to the system bus [col. 4, lines 10-16]. O' Brien teaches the occupancy level of the receiving buffer being compared with the vacancy level of the transmitting buffer, and

when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, the receiving buffer is granted access to the system bus if the occupancy level of the receiving buffer is increasing and if the vacancy level of the transmitting buffer is not increasing [col. 3, line 7-col. 5, line 5] - as the receiving buffer still has the greatest need under such condition; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer (i.e. when the occupancy level of the receiving buffer is equal to the vacancy level of the transmitting buffer), the transmitting buffer is granted access to the system bus if the vacancy level of the transmitting buffer is increasing and if the occupancy level of the receiving buffer is not increasing [col. 3, line 7-col. 5, line 5] - as the transmitting buffer has the greatest need under such condition.

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13. As per claim 15, O'Brien teaches when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, the transmitting buffer is granted access to the system bus if the occupancy level of the receiving buffer is not increasing and if the vacancy level of the transmitting buffer is increasing to a level that is higher than the occupancy level of a receiving buffer [col. 3, line 7-col. 5, line 5] - as the transmitting buffer has the greatest need under such condition; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer (i.e. when the occupancy level of the receiving buffer is equal to the vacancy level of the transmitting buffer), the receiving buffer is granted access to the system bus if the vacancy level of the transmitting buffer is not increasing and if the occupancy of the receiving buffer is increasing [col. 3, line 7-col. 5, line 5] - as the receiving buffer has the greatest need under such condition.

14. As per claim 16, the combination of Yang, Brown, Rudin and O'Brien, teaches the method for controlling a transmitting and a receiving buffer of a network controller, hence teaches a program for executing the method using a computer, the program inherently being recorded on a computer readable recording medium for execution on a computer.

15. As per claim 17, Yang teaches granting access to the system bus comprising receiving the request for access to the system bus from one of the transmitting and receiving buffers and granting access to the system bus to the one of the transmitting and receiving buffers sending the request [col. 3, lines 46-48].

***Allowable Subject Matter***

16. Claims 8-11 are allowed.

***Response to Arguments***

17. Applicant's arguments with respect to claims 1-7 are moot in view of claims 1-7 being withdrawn. Applicant's arguments with respect to claims 12-17 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments with respect to claims 8-11 have been considered and result in claims 8-11 being allowed.

***Conclusion***

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Quang Nguyen whose telephone number is (571) 272-4154 and whose e-mail address is [tanh.nguyen36@uspto.gov](mailto:tanh.nguyen36@uspto.gov). The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached on (571) 272-4083. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for After Final, Official, and Customer Services, or (571) 273-4154 for Draft to the Examiner (please label "PROPOSED" or "DRAFT").

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